IOWA DEPARTMENT OF TRANSPORTATION

To Office Bridges and Structures Date August 17, 2006

Attention All Employees Ref No. 521.1

From Gary Novey

Office Bridges and Structures

Subject Method's Memo No. 148 (Review of Existing Sign Truss for Larger Sign Areas)

Periodically the Office of Traffic and Safety updates existing traffic signs. When these updates include changes to sign areas for overhead sign supports (overhead sign trusses, cantilever trusses, and bridge mounted sign supports) a review of the supports is required by the Office of Bridges and Structures. To aid in the review by our office, the Office of Traffic and Safety will provide:

- 1. A copy of the original design plans.
- 2. The sign dimensions for all signs that will remain on the truss.
- 3. The dimensions of the new signs being installed on the trusses.

Review of maintenance files will not be required. Inspections were made of the supports and deficiencies were repaired. Plans are to continue the inspections and repairs in the future.

After determining if the new signs are acceptable or not, relay this information to Traffic and Safety. Based on the review, there are three options:

- 1. Sign supports are acceptable with the new sign areas.
- 2. If the signs fail the review, request Traffic and Safety to design smaller signs.
- 3. If that is not possible, then replacement of the sign supports will be required.

1. Overhead Sign Truss

The review of overhead sign trusses shall be based on the allowable sign area and wind load shown on the plan. If the new sign area is over the allowable sign area or the sign height is greater than the allowable sign height, an approximate analysis shall be performed. The approximate analysis shall consist of assuming the truss to be a simple span beam and the supports to be simple cantilevers. Place the wind loads on the allowable sign area to determine the moment and shears in the truss, which is modeled as a simple beam, and the axial load and moment at the base of the posts. Compare these reactions to those determined using the new sign area and location. If the moments, shears and axial loads are no more than 10 percent greater than those calculated for the allowable sign area, the new sign area may be approved. If the sign height extends above the top chord of the truss more than 5'-3 (1600 mm), the spacing of the 6"x3 1/2"x1/2" (152 mm x 89 mm x 12.7 mm) angles will need to be reduced from the 5'-0 (1520 mm)

maximum based on the 2001 edition of the Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and this new dimension will need to be provided to Traffic and Safety for inclusion in their plan set.

2. Cantilever Sign Trusses

The review of cantilever sign trusses shall be based on the sign area shown on the plan. If the new sign area is less than or equal to the sign area shown on the plan, then the new sign area may be approved. If the new sign area is greater than the sign area shown on the plan, then the sign area will be limited to the size shown in the tables below. Table 1 applies to cantilevers with a 22" or 24" (559 mm or 610 mm) diameter by 1/2" (12.7 mm) thick steel pipe end support with a maximum height of 27'-0 (8230 mm) and aluminum primary truss members composed of 5 1/2"ø x 5/16" (139 mm x 7.9 mm) and secondary aluminum members 2 1/2"ø x 1/4", 2 1/4"ø x 3/16", 2"ø x 3/16" and 2"ø x 1/4" (63 mm x 6.3 mm, 57 mm x 4.7 mm, 50 mm 4.7 mm, and 50 x 6.3 mm). Table 2 applies to cantilevers with an 18" (457 mm) diameter by 1/2" (12.7 mm) thick steel pipe end support with a maximum height of 27'-0 (8230 mm) and aluminum primary truss members composed of 5 1/2"ø x 5/16" (139 mm x 7.9 mm) and secondary aluminum members 2 1/2"ø x 3/16", 1 3/4"ø x 3/16" and 2"ø x 3/16" (63 mm x 4.7 mm, 44 mm x 4.7 mm, and 50 mm x 4.7 mm).

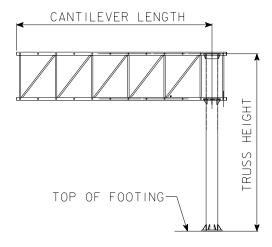


Table No. 1

CANTILEVER	MAXIMUM SIGN	MAXIMUM SIGN
LENGTH MAXIMUM	HEIGHT	AREA (ft ²)
35'-0 (10 660 mm)	14'-0 (4260 mm)	210 ft ² (19.5m ²)
34'-0 (10 360 mm)	14'-0 (4260 mm)	224 ft ² (20.8m ²)
33'-0 (10060 mm)	14'-0 (4260 mm)	238 ft ² (22.1m ²)

Table No. 2

CANTILEVER	MAXIMUM SIGN	MAXIMUM SIGN
LENGTH MAXIMUM	HEIGHT	AREA
33'-0 (10060 mm)	10'-0 (3050 mm)	150 ft ² (13.9m ²)
30'-0 (9100 mm)	11'-0 (3350 mm)	176 ft ² (16.4m ²)
27'-6 (8380 mm)	12'-0 (3650 mm)	192 ft ² (17.8m ²)

3. Bridge Mounted Sign Supports

The review of bridge mounted sign supports will be based on the truss and sign limits in the original plan set. New signs will be allowed to extend one foot (300 mm) above the top of the vertical sign members. This requirement applies to all signs including exit signs and hospital signs added to the top of existing sign configurations.

GAN/dgb/bj